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CLAIMS

1. A process for the production of synthesis gas, by means of the catalytic partial oxidation or autothermal reforming of light hydrocarbons, which comprises partially oxidizing the hydrocarbon with oxygen coming from the reduction of at least one metal oxide selected from hexavalent chromium oxide, supported on an inert carrier and modified with an alkaline and/or earth-alkaline metal, and metal oxides capable of autonomously sustaining the catalytic partial oxidation reaction by means of redox cycles.

- 2. The process according to claim 1, wherein the metal oxides capable of autonomously sustaining the catalytic partial oxidation reaction by means of redox cycles are selected from silver oxide, nickel oxide and lead oxide.
- 3. The process according to claim 1 or 2, wherein the chromium VI oxide or the other oxides capable of autonomously sustaining the catalytic partial oxidation reaction by means of redox cycles are used in a mixture with other metal oxides, capable of undergoing redox cycles, in such proportions as to maintain the formation reaction of synthesis gas globally exothermic.
- 4. The process according to claim 1, wherein the metal oxide is hexavalent shromium oxide.
- 5. A process for the production of synthesis gas, by means of the catalytic partial oxidation reaction or auto-

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thermal reforming of light hydrocarbons, which comprises:

(i) partially oxidizing the hydrocarbon with oxygen coming from the reduction reaction of an oxidizing system, comprising hexavalent chromium oxide, according to the scheme:

$$A_{CrO_3} = 2Cr_2O_3 + 3O_2$$
 (IV)

wherein the chromium oxides of reaction (IV) are supported inert inorganic material modified with alkaline and/or earth-alkaline metals; and

- re-oxidizing the supported Cr_2O_3 to CrO_3 by means of air in a reactor maintained at a temperature which is sub-10 stantially equal to or lower that present in the reactor of step (i).
- The process according to claim 5, wherein the oxidizing system comprises chromium VI oxide mixed with other metal oxides, capable of undergoing tedox cycles, in such 15 proportions as to maintain the format 1 on reaction of synthesis gas globally exothermic.

The continuous process for the production of synthesis gas by the autothermal reforming of light hydrocarbons, ac-

- cording to claim 5 or 6, which comprises:
 - feeding the hydrocarbon stream in gas phase to a first fluid bed partial oxidation reactor, contain ing a solid, comprising CrO3;
- (b) discharging a gas stream essentially consisting of H_2 , CO and, optionally, the non-reacted hydrocarbon phase, from 25

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the head of the first reactor;

- (c) collecting at the bottom of the first reactor a solid containing chromium III oxide and feeding this to a second fluid bed regeneration reactor maintained at a temperature substantially equal to or lower than that present in the oxidation reactor;
- (d) feeding to the bottom of the second regeneration reactor a stream of air at high temperature;
- (e) recycling the regenerated solid to the first oxidation reactor.
- 8. The process according to claim 7, wherein in the first fluid bed oxidation reactor a temperature ranging from 800 to 1100°C is maintained, together with a pressure ranging from 0.5 to 5 MPa.
- 9. The process according to claim 7 or 8, wherein in the second regeneration reactor the same operating conditions present in the first reactor are substantially maintained.